



UAS and SmallSat Weekly News

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10Dec17

Lindbergh Cruises Into Electric VTOL Air Taxi Market Dec 6, 2017 Graham

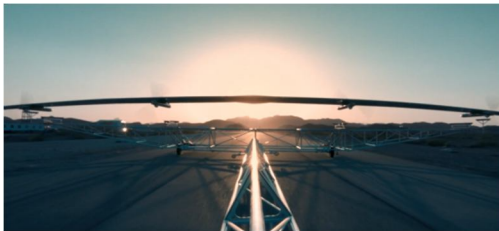
Warwick | Aviation Daily



Adding to the scores of similar projects already in the works, Erik Lindbergh—grandson of Charles Lindbergh and long-time advocate for electric flight—has formed a company to develop an electric vertical-takeoff-and-landing (eVTOL) air taxi.

While the majority of eVTOLs in development are battery-powered, VerdeGo's two-seat PAT200 (PAT stands for Personal Air Taxi) **has hybrid-electric propulsion**. A combustion engine generates electricity for eight motors and propellers mounted on the aircraft's tandem tilting wings.

Facebook's solar drone to serve wifi, stay aloft 90 days – alpha model goes to museum [John Fitzgerald Weaver](#) - Dec. 8th 2017 [@SolarInMASS](#)



Facebook's (soon to be) solar-powered, wifi serving, laser mesh network drone, the Aquila, is retiring to the V&A – the world's leading museum of art and design – in London.

The plane has completed two successful test flights, one each in 2016 and 2017. Facebook's goal is to create a broad network of technology to deliver internet connectivity to the 1.6 billion on earth without access.

The plane was built in Somerset, England [and is returning home for display](#). Facebook believes its [high altitude platform stations \(HAPS\) program](#), that includes the drone, will fill in where cellular towers are uneconomical. The final design hopes to have a plane that can fly without human intervention or refueling for 90 days straight.

The units will communicate with each other and users on the ground using [lasers and millimeter wave hardware](#). In testing in 2015, the lasers were able to deliver '10s of Gb per second to a target the size of a dime from more than 10 miles away.' A single unit hopes to deliver data across a 60 mile wide diameter. <https://electrek.co/2017/12/08/facebook-solar-drone/>



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DRONES TAKE OFF IN THE BATTLE AGAINST THE LOS ANGELES FIRES JACK STEWART 12.08.17



Firefighters monitor a section of the Thomas Fire along the 101 freeway on December 7, 2017 north of Ventura, CA.

As of Friday afternoon, Southern California was battling blazes in Los Angeles, Ventura, and San Diego counties, [which had destroyed more than 500 structures](#), and forced over 200,000 people to flee.

The Los Angeles Fire Department has a new tool that could reduce the risk for firefighters. "For the first time ever, we're going to use our drones," LAFD Chief Ralph Terrazas said at a news conference on Thursday.

Shortly afterwards, a firefighter, in his shirtsleeves, launched one of two quadcopters into the air. From the ground, he flew it over the scar of the Skirball fire, which destroyed at least six mansions in the ritzy Bel Air area. Using on-board cameras, he surveyed the damaged property, and got a precise view of the path of the fire. A second drone carried an infrared camera to highlight remaining hotspots, which firefighters could then track down and finish off.

The Skirball fire is tiny compared to the other blazes in the LA region, but because it's near homes and the major 405 freeway, it provided **a good test case** to figure out how much detail drones can usefully see. These two successful drone flights, the first ever for the fire department, lasted about 30 minutes, and the firefighters say that's just a start. <https://www.wired.com/story/drones-take-off-in-the-battle-against-the-los-angeles-fires/>

Instead Of Water, Military Drones Helping Fight Fire With Data DECEMBER 9, 2017, [CNN WIRE](#)



MORENO VALLEY, Calif. — In a partnership between state fire protection agency CAL FIRE and the California Air National Guard, unmanned drones have been assisting firefighters by relaying information that those on the ground could not otherwise get.

The MQ-9 Reapers that were deployed this week have sensors that **can see through smoke** and feed back live video to the fire command.



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“We can show [firefighters] where the fire’s moving or if the embers start flying four or five miles away,” drone pilot Col. Sean Navin [told KCBS](#) Friday. “They have literally real-time data, and they can start taking their limited resources and putting them where it counts most.”

They can fly twice as high as a news chopper, and they are not as affected by winds at those altitudes. Another benefit is that drones can fly around the clock — no breaks needed.

The program is relatively new, and for some of the drone pilots, it’s the first time they’ve flown over an emergency in their own communities. Because it’s their neighbors on the ground, it’s their homes they’re trying to save. From what they’ve been seeing, it looks like they’re making progress. <http://kdvr.com/2017/12/09/instead-of-water-military-drones-helping-fight-southern-california-fires-with-data/>

Virginia Tech Helps Malawi Drone Corridor Take Flight MARCO MARGARITOFF

DECEMBER 8, 2017



[In June, UNICEF partnered with U.S. company Zipline to use the city of Kasungu in Malawi as Africa’s first drone “air corridor” to test the use of unmanned aerial vehicles as a rapid transport method of delivering time-sensitive medicine and supplies.](#) A big leap toward that reality was made in November when [Virginia Tech partnered with the local Kasungu drone teams to test the new EcoSoar drone and refine UNICEF’s air corridor established in the summer.](#)

[According to VTNews](#), Virginia Tech’s Unmanned Systems Lab has already **set several records** in Malawi, including accomplishing the longest cross-country UAV flight, the first flight of an aircraft constructed by Malawians, and the first delivery of a payload from a health clinic.

The EcoSoar covered 11.8 miles (19 kilometers) of autonomous flight November 9 and transported a package from Gogode Health Clinic to the Kasungu Airport. Perhaps the most significant of the records is that Malawians themselves produced this drone with VTech’s help. Graduate students Zack Standridge and James Donnelly, with professor Kevin Kochersberger, supervised students of the Malawi University of Science and Technology to achieve this highly admirable feat. The thirteen MUST students took two days to construct the drone and tested it for one day in front of hundreds of local villagers.



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"EcoSoar was designed with low-resource environments in mind," [Kochersberger explained](#). The drone costs \$350 to produce and utilizes practical materials such as foamcore poster board and parts easily 3D-printed. "I envision entrepreneurs in Malawi establishing businesses around the use of this aircraft-building, operating, and maintaining EcoSoar for both medical deliveries and environmental assessment activities." <http://www.thedrive.com/aerial/16819/virginia-tech-helps-malawi-drone-corridor-take-flight>

This disposable drone hides inside the shell of a 'fake' bomb and can be dropped from a fighter jet *Immanuel Jotham December 10, 2017*

The small, 12 foot-long drones equipped with cameras can stay in the air for about 10 hours and record vital enemy positions and video.



Large drones may no longer be required for recon missions in the future.

Northrop Grumman (NG) is working on a drone that can be placed inside the shell of a cluster bomb that will spring into action after being dropped from a fighter jet or bomber. The drone will fly, undetected, behind enemy lines as it collects and transmits information back to its base. It will then crash and destroy itself.

Remedy will be deployed out of the 'fake' bomb after it is released from a military aircraft using a parachute. Its two, 12-foot long wings will then fold out, and the drone will be powered by one motor, using a small wooden propeller. Each drone will have 10 hours of flight time, flying at nearly 130 kmph, according to the report.

While that seems really small and slow, especially when one considers the [supersonic drones](#) that are in the works, Thompson said that is exactly how Remedy has been designed. A craft this small and slow will appear like a bird on enemy radar, he said, which will allow these drones to continue collecting data for as long as they possibly can since they are likely to go undetected. <http://www.ibtimes.co.uk/this-disposable-drone-hides-inside-shell-fake-bomb-can-be-dropped-fighter-jet-1650909>

The Day Of The Drone -- How Flying Robots Are Revolutionizing Business DEC 7, 2017 Bertrand Moingeon, Lloyd Chisholm and Elisabeth Lefranc Bertrand Moingeon is Professor at HEC Paris, Lloyd Chisholm and Dr Elisabeth Lefranc are consultants in Digital Transformation



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Thanks to drones, companies not only can design innovative value propositions, but also radically modify the way they operate

Few would have imagined the transformation of unmanned aerial vehicles (UAV), commonly known as drones, from toys for adults to revolutionary machines for businesses, the military, cinema, maintenance groups, fire-fighters, health services, farming and so much more. As a result, UAV sales have shot up: in the U.S. alone, they saw a **224% increase in the April 2016-April 2017 period** alone. And a recent PwC analysis has priced the overall market at a staggering **\$127 billion**.

But, as competition in the marketplace drives down prices, how exactly will drones revisit traditional business models? As the software evolves at blinding speed and drones collect data with growing ease, what new horizons will they take industry to? One thing is for sure: thanks to them, companies not only can design innovative value propositions, but also radically modify the way they operate.

Unmanned Aerial Systems (UAS), is the [all-encompassing term](#) that includes the UAV, or drone. Military drones have been around since the World War One when the Dayton-Wright Airplane Company used aerial torpedoes to explode at preset times. But, a century later, drones are filling a totally different niche, as improvements in software and management of drones simplify their use and allow for greater autonomy in functions such as collision avoidance, data collection, pre-programmed flight routing, Bluetooth capability, active tracking, terrain follow, etc. 99% of all drones now sold in the U.S. are for the consumer market, with prices ranging from \$100 (toy drones), to highly sophisticated UAVs with sensors and controls worth 100 times that figure. <https://www.forbes.com/sites/hecparris/2017/12/07/the-day-of-the-drone-how-flying-robots-are-revolutionizing-business/#4a4c9c2b93a0>

11Dec17

UNIVERSITY OF MARYLAND UAS TEST SITE ACQUIRES 11 TIGERSHARK UAS AUVSI NEWS DEC 8, 2017

The University of Maryland UAS Test Site has acquired 11 TigerShark UAS, which adds to the **test site's fleet of more than 40 aircraft**, and will ultimately help enhance and expand the long-range testing efforts of the site.



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Some of the TigerShark's characteristics include its ability to carry up to **100 pounds of payload**, being able to **stay airborne for up to seven hours**, and being able to operate as high as **14,000 feet**.

Before acquiring the TigerShark UAS, test site pilots and engineers could only perform operations where sensors and other equipment weighed in under 20 pounds, so the TigerShark UAS will be extremely beneficial according to the director of the UAS Test Site, Matt Scassero.

"Some of the most crucial applications of UAS technology—disaster response, communications relay, underground surveys—require the ability to carry heavier payloads for longer periods of time and over distances greater than most commercially available vehicles can manage," [Scassero says](#).

"With the TigerSharks, we are well positioned to advance innovations in processes and technologies for use in civilian and defense operations."

The first research operation that will feature the newly acquired TigerShark UAS will be a collaboration with the Naval Air Warfare Center Aircraft Division (NAWCAD) "aimed at establishing a communication relay that allows individuals to remotely control ground robots." <http://www.auvsi.org/industry-news/university-maryland-uas-test-site-acquires-11-tigershark-uas>

Measure Expedites Problem Resolution for Electrical Utilities with New Drone Toolkit for Linemen

Measure

WASHINGTON, Dec. 5, 2017 /PRNewswire/ -- [Measure](#), the largest U.S. provider of drone services to enterprise customers, today announced a [new drone toolkit](#) that enables electrical utilities to build a professional drone inspection program staffed by their own linemen. The package trains and equips linemen to quickly and safely identify structural defects and damage on transmission lines, towers and substations, making it possible to examine known or suspected trouble **spots without the time, expense and risk of mobilizing a helicopter or physically climbing a pole or tower** to perform an inspection.



The Utility Toolkit complements Measure's professional drone inspection services for critical infrastructure, including a robust new reporting suite with FedRAMP (Federal Risk and Authorization Management Program)-approved cloud storage allowing operations managers to access detailed, user-friendly inspection information on each asset through a secure online portal.

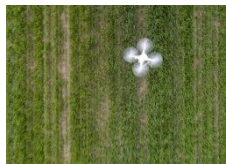


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Developed by linemen for linemen, the toolkit facilitates the process of identifying high-priority defects ranging from damaged insulators, poles and conductors to broken ground wires, broken crossarms, missing aerial numbers, and downed trees. Detailed image capture allows linemen to zero in on problem areas and instantly pinpoint maintenance issues from a ground control flight app in the field. <https://www.prnewswire.com/news-releases/measure-expedites-problem-resolution-for-electrical-utilities-with-new-drone-toolkit-for-linemen-300566547.html>

Washington's Department of Natural Resources is showing what drones can do for government

Workers say the program has grown more sophisticated this year, indicating signs of potential in the emerging technology. Colin Wood DECEMBER 1, 2017



As the federal government figures out how to regulate drones, state government is figuring out how to use them to make its work safer and faster.

The Washington Department of Natural Resources (WA DNR) started its drone — or unmanned aerial system (UAS) — program in 2015, but workers told StateScoop it wasn't until this year that the program began to take shape. With **a wide variety of applications** in mind, from wetland mapping to emergency radio communications, the department is pursuing new projects across its divisions, and even applying for permission from the Federal Aviation Administration (FAA) to expand its projects into more experimental territory.

Miles Micheletti, who works within WA DNR's forest resources division, told StateScoop his department has a lot of ideas in mind for future applications, like using drones to carry heavy seed bundles up dangerous slopes in forested areas, providing a radio tower link for firefighters working in rough terrain, monitoring the administration of herbicides and mapping landslides. <http://statescoop.com/washingtons-department-of-natural-resources-is-showing-what-drones-can-do-for-government>

Chinese passenger drone maker says it will turn a profit within two years

Saheli Roy Choudhury | Eunice Yoon CNBC.com

EHang [drew worldwide attention](#) last year at the Consumer Electronics Show in Las Vegas, where it showcased a drone that has the capacity to **carry a human passenger** over short-to-medium distances.



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The electricity-powered drone, called EHang 184, can carry up to 220 pounds (100 kilograms) of weight for 25 minutes. It has an average cruising speed of 37 miles per hour (60 kilometers per hour) and has a ceiling of 500 meters above sea level.

The drone market is expected to generate more than [\\$11.2 billion in revenue by 2020](#), according to a February prediction from research firm Gartner.

<https://www.cnbc.com/2017/12/11/passenger-drone-maker-ehang-expects-profits-in-2-years.html>

Mountain rescuers to trial drone and sonar technology 11 December 2017



Brecon Mountain Rescue Team is to trial new technology, including drones and sonar, as the service deals with **another record year of callouts**.

The increase in demand seen by rescuers from across **Wales** has been blamed on several factors, including more people exploring the outdoors.

Brecon MRT hopes new equipment will improve its response to incidents and lead to positive outcomes. Up to last week, the team had spent 4,784 hours on 122 searches in 2017, compared with 121 in 2016. Deputy team leader Dave Coombes said the adapted sonar technology, which is normally used by anglers to find fish, would be used to map and record dangerous parts of rivers. "So when we then go and search an area we can compare the maps we've made with the day of the incident and see if there are any anomalies which might guide us where to search," he said.



In north Wales, Llanberis Mountain Rescue has seen a record year with 220 incidents, although there are still three weeks of December still to go. It had slightly fewer callouts last year. <http://www.bbc.com/news/uk-wales-42281244>

Global Drone Company Makes Predictions for the State of the Drone Industry in 2018 Miriam McNabbon: December 11, 2017



As the New Year approaches, it's time to start thinking about what 2018 will bring. Ivan Tolchinsky, CEO of global automated drone company [Atlas Dynamics](#), takes a world view of the industry and offers some predictions of



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what's next.

Tolchinsky has followed his company and manufacturing organization across the globe. He's worked in Israel, Europe and China as the Atlas product – a fully autonomous commercial drone system with docking system – has evolved. He sees four major trends emerging in the industry.

Regulations Will Increase driven by concerns over safety, privacy, and the illicit use of consumer drones to commit terror attacks. However: this will open the market further for commercial drones, having begun to prove their worth in providing disaster relief.

Security and First Responders are Early Adopters Early adopters will be in security and first response, as seen during the natural disasters which struck the US and Puerto Rico this year delivering supplies, infrastructure assessments and damage surveys, and search and rescue missions.

Drone Technology Fully integrated command, and control systems will enable autonomous operations and an increase in BVLOS operations. The increased use of mesh networks will allow communication and data transfer between drones for automatic security response and connectivity in emergency situations.

The Drone Business Model will shift from outsourcing drones-as-a-service to organizations implementing in-house strategies. This will be enabled by fully autonomous platforms.

<https://dronelife.com/2017/12/11/global-drone-company/>

12Dec17

AMERICAN ROBOTICS UNVEILS UAS PLATFORM FOR PRECISION FARMING AUVSI NEWS DEC 11, 2017

An industrial UAS developer called American Robotics has unveiled its flagship product, Scout, which is a self-charging, self-managing UAS platform capable of autonomously conducting daily scouting missions in the field of precision farming.



Specializing in agricultural automation, American Robotics says that traditional scouting techniques are “inadequate at detecting plant stress early enough to offset the billions of dollars of lost yields.” A lot of the times, these methods, which can include first-generation and consumer UAS, are time-consuming, complicated, and not financially prudent. “Full-automation is a key ingredient in the future of precision farming, and we’re



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eager and excited to finally deliver this capability to our customers.”

<http://www.auvsi.org/industry-news/american-robotics-unveils-uas-platform-precision-farming>

UAVOS Converts Light Aircraft into Multifunctional UAV 12 Dec 2017 | Caroline Rees

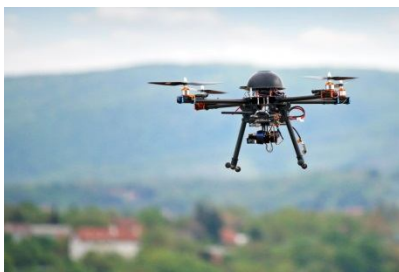


[Uavos](#) has announced that the company has created an unmanned aerial vehicle (UAV) based on the Sinus light aircraft manufactured on a large scale by Pipistrel. This project is a part of an overall plan to create **a multifunctional aerial robotic system that is able to carry out group missions with an integrated special payload.** Test flights demonstrated excellent synchronization of the on-board control system with payloads during a simultaneous flight of three unmanned vehicles.

The system includes an unmanned aerial vehicle and a ground control station. With a payload weight of 441 lb (200 kg) the aircraft can fly for 5 hours. The maximum cruising speed is 75 mph (120 km/h), and the operating temperature range is -40°F to 122°F (-40°C to +50°C). The flight time with a payload weight of 88 lb (40 kg) is 20 hours. Take-off, en-route flight and landing of the drone are carried out in fully automatic mode.

http://www.unmannedsystemstechnology.com/2017/12/uavos-converts-light-aircraft-multifunctional-uav/?utm_source=Unmanned+Systems+Technology+Newsletter&utm_campaign=602334170c-eBrief_2017_Dec_12&utm_medium=email&utm_term=0_6fc3c01e8d-602334170c-119747501

MicroPilot Integrates Sense & Avoid System into UAV Autopilot 04 Dec 2017 | Caroline Rees



[MicroPilot](#) has announced that it has successfully integrated the [FLARM](#) Sense and Avoid system with its autopilot, granting clients a **reliable autonomous collision avoidance option for fully autonomous UAV operations.**

With any form of autonomous vehicle, one of the major concerns is the ability to safely avoid collisions without human intervention. A sense and avoid system allows a UAV to do exactly that, dramatically reducing operational risks and the need for human monitoring.

FLARM is a traffic awareness and collision avoidance technology used by light aircraft and UAVs. When integrated with MicroPilot’s autopilot, the system alerts the autopilot of nearby aircraft,



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along with their velocity and altitude. Using this information, the autopilot decides how to avoid the other aircraft, autonomously preventing a collision without a single input from a human operator. http://www.unmannedsystemstechnology.com/2017/12/micropilot-integrates-sense-avoid-system-uav-autopilot/?utm_source=Unmanned+Systems+Technology+Newsletter&utm_campaign=602334170c-eBrief_2017_Dec_12&utm_medium=email&utm_term=0_6fc3c01e8d-602334170c-119747501

New drone laws in effect in NC Dec 01, 2017

PITT COUNTY, NC (WITN) If you have, or will be getting a drone, you need to be aware of new laws that are now in effect in NC.



The first **prohibits drone use near prisons, jails** and other containment facilities. The second revises existing state drone laws by changing them to clarify unmanned aircraft **laws now apply to model aircraft** as well."

Both bills were passed by the legislature in June and define a mandatory horizontal distance of 500 feet or a vertical distance of 250 feet from containment facilities.

The bills also loosen restrictions on the use of drones in emergency situations by permitting private and commercial operators to assist law enforcement with emergency management efforts such as search and rescue operations.

Signs will be placed around facilities where the use of drones is now banned to remind users of the boundaries at which they need to be to operate their drones.

<http://www.witn.com/content/news/New-drone-laws-in-effect-in-NC-461393033.html>

Drones Can Help Respond to Disasters – As Long as They Belong There Miriam

McNabbon: December 11, 2017



News and Commentary. In the category of "this shouldn't need to be said," we'll say it – drone operators should stay away from the California wildfires if they aren't part of the emergency response. The FAA has issued [temporary flight restrictions \(TFRs\) over the fires](#), and warns that violators may be fined up to \$20,000. Western region FAA representative Ian Gregor issued a press release this weekend asking operators not to interfere.

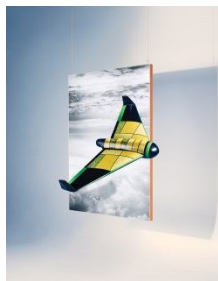


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Drones have been used for flood and damage assessment, to speed insurance claims, identify stranded victims, help responders allocate resources, and in some cases provide planning assistance to guard against future events. In fact, at a drone conference speech immediately after the Houston flooding, FAA Administrator Michael Huerta called **the use of drones in disaster relief “a turning point” for the industry.**

In the last week, [Wired magazine](#) published a piece about the LAFD using their drones for the first time in the Skirball fire to help identify hotspots, track the path of the fire, and monitor damage. Communities can now see the benefits that drones provide, not only the problems that rogue drones cause. It’s up to all drone operators to use good judgement to ensure that the trend continues. <https://dronelife.com/2017/12/11/drones-can-help-respond-disasters-long-belong/>

Food Flier —*Ben Taub*



The Pouncer, a hundred-and-forty-five-pound edible glider, with a ten-foot wingspan, is designed to be released from a cargo plane as far as sixty miles from its target. The fuselage is packed with grains; the Pouncer’s entire menu is customizable to cultural tastes and sensitivities. According to Gifford, in a complex humanitarian emergency—such as an earthquake in a mountainous area, with many villages but no usable roads—a plane could carry several hundred Pouncers, each programmed with different landing coordinates. The

Pouncer has no engine, but its navigation system can adjust the wings to guide it to within twenty-three feet of its target.

The frame has some wooden components, but Gifford intends eventually to replace them with food. “Some parts can be made with a hard-baked, flour-based material that can be soaked in water and added to a meal,” he said. Dried, vacuum-packed meats show promise as landing gear. https://www.newyorker.com/magazine/2017/12/18/micro-revolutions-spidersilk-edible-drones-artificial-wombs-and-more?mbid=nl_Weekly%20121117&CNDID=42240258&spMailingID=12541660&spUserID=MTMONDA3MTE4MzU1S0&spJobID=1301049067&spReportId=MTMwMTA0OTA2NwS2



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Drones in Australia Help Surfers Keep Away From Sharks [MARCO MARGARITOFF](#)

DECEMBER 12, 2017

Surf Life Saving WA is using drones to spot sharks on five beaches in Australia.



In the past week, [Surf Life Saving WA](#) has begun implementing an unmanned aerial vehicle on a beach near Perth to spot sharks and protect swimmers and surfers nearby from getting face to face with the dangerous predators. [According to WAtoday](#), two sharks were within 300 feet of swimmers in the past seven days. It's becoming clear that using affordable, user-friendly drones is not only more readily available than a helicopter, or more effective than a lifeguard's ability to spot a submerged predator, but can actually save lives.



By all accounts, this is an excellent method to spot oceanic danger. Unmanned aerial vehicles have become affordable, easy to use, and can be equipped with all sorts of high-quality cameras, including thermal-imaging and night vision. A traditional lifeguard wouldn't be able to accurately determine how many predators, of what kind, and in what amount, are lurking in the waters. Suddenly, this new aerial tool is able to easily, clearly spot anything swimming near unsuspecting beachgoers—actively saving them from harm, or even death. <http://www.thedrive.com/aerial/16913/drones-in-australia-help-surfers-keep-away-from-sharks>

Broken Arrow police: New drone provides tactical support *The Associated Press*

DECEMBER 12, 2017 BROKEN ARROW, OKLA.

Police in northeastern Oklahoma say a new \$2,500 drone will help survey crime and crash scenes and provide tactical support. "We do not want this to be a secret to people," Koch said. "The Police Department is not out to spy on anyone. There's not going to be any surveillance conducted." It will be used in tactical situations, for crime and crash scene investigations, search and rescue operations, emergency management scenarios and public relations, the department said.

Koch said having an aerial view will help investigators put together complex scenes and will be a critical tool to leverage during dangerous encounters, such as hostage situations or with a



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barricaded subject. "The SOT commander will be able to see what the (drone) is seeing without putting officers more at risk," Koch said. <http://www.miamiherald.com/news/politics-government/national-politics/article189312474.html>

Trump signs law forcing drone users to register with FAA MELANIE ZANONA - 12/12/17



[President Trump](#) signed a sweeping defense policy bill into law on Tuesday that will allow the government **to require recreational drone users to register their model aircraft.**

A federal court [ruled earlier this year](#) that the Federal Aviation Administration (FAA) did not have the power to force toy drone users to register their aircraft with the agency because Congress had said in a previous a law that the FAA can't regulate model aircraft.

But the 2018 National Defense Authorization Act, which landed on Trump's desk Tuesday, would restore the FAA's registration system for civilian drones.

A D.C.-based appeals court cited the 2012 law in its ruling striking down the FAA drone registry, arguing that recreational drones count as model aircraft and that the registry counts as a rule or regulation. Lawmakers included a fix for the issue in a Senate aviation bill this summer, but that legislation has been stalled, which is why the language was attached to the defense measure. <http://thehill.com/policy/transportation/364523-trump-signs-law-forcing-toy-drone-users-to-register-with-govt>

Pan-European drone project detects toxic gases in disaster zones 13th December 2017 *A multimillion-dollar, multi-partner European drone project is using photonics to detect toxic gases in the atmosphere following events such as wildfires, chemical explosions and volcanic eruptions.*



Going by the slightly laboured acronym [FLAIR](#) (FLYing ultra-broadband single-shot Infra-Red Sensor), the fixed-wing drone will be able to reach speeds of 120km/h, an altitude of 4,000m, and cover a radius of 80km. Onboard will be a super-continuum **laser** capable of detecting tiny concentrations of **a range of gases, including carbon dioxide, methane, sulphur oxides, and nitrogen dioxide.**



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The drone project, which is expected to deliver a prototype in 2018, has already received over €3m from the EU's Horizon 2020 fund via the Photonics Public Private Partnership. It features partners from across the continent, led by Portugal's Tekever Autonomous Systems.

"For the first time, a drone reaching altitudes of up to 4000 metres will be able to detect fine traces of air molecules that are dangerous to our health with a state-of-the-art laser sensor," said Tekever Autonomous Systems' André Oliveira. "The drone can map out areas that are too dangerous for humans to go and can transmit data in real time to a ground processing unit."

The gas concentrations are measured by reading the unique frequencies or 'signatures' of the air sample that become absorbed and 'dimmed' in the laser light. To improve detection, the frequencies of the various gases are separated. The light then passes through a series of gratings and lenses, illuminating the surface of a multi-pixel detector which is able to distinguish particles at the photon level. <https://www.theengineer.co.uk/european-drone-project-toxic-gases/>

Drones Get New Integration Tool in New Zealand: AirMap Partners with Airways New Zealand

Miriam McNabbon: December 13, 2017



The US-based drone airspace intelligence platform [AirMap](#) has partnered with [Airways New Zealand](#) to deploy New Zealand's **first unmanned traffic management system**.

The three month trial in the Canterbury and Queenstown regions of New Zealand will provide low altitude authorization and notification capabilities. "Using AirMap's free iOS and Android apps, drone operators can request digital airspace and public land owner approvals required by New Zealand's Civil Aviation Authority," says an AirMap announcement. "...Commercial and recreational drone operators are invited to take part in the trial, which is currently underway and will significantly simplify and streamline the authorization process."

"Airspace managers participating in the trial are using the AirMap airspace management dashboard to provide digital flight authorizations and share real-time updates about the location of events, community gatherings, emergencies, and other areas to avoid. This information is delivered immediately to the AirMap app to enable safer flights and more comprehensive situational awareness." <https://dronelife.com/2017/12/13/airmap-partners-with-airways-new-zealand/>



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14Dec17

BAE Systems tests drone controlled by blasts of air that could lead to faster and stealthier aircraft Alan Tovey, industry editor 13 DECEMBER 2017



The Magma drone is controlled by blasts of air taken from its jet engine and blown over its wings

A drone aircraft which does away with conventional flight controls to manoeuvre and instead uses jets of air to change direction has been tested by defence company BAE Systems and the University of Manchester.

The Magma unmanned aircraft has completed a series of flights and the success of the programme could lead to the development of lighter, more manoeuvrable military and civil aircraft, which require less maintenance. The system could also allow for sleeker designs which are faster, and in the case of military aircraft, simpler to design so they are "stealthy" and less likely to show up on radar.

Researchers tested two systems on the Magma UAV. The first was "wing circulation control", which takes air from the jet engine and blows it at supersonic speeds over the back of the wing. The second system developed was "fluidic thrust vectoring", which uses jets of air to deflect the engine exhaust, also allowing for the direction of the aircraft to be changed.

Using blasts of air to replace mechanical or hydraulic systems to move control surfaces which need control rods and pumps or motors could strip out weight, making future aircraft lighter and more efficient. BAE and academics plan further flight tests over the next few months for the systems **with the ultimate aim of doing away with conventional controls ailerons and flaps altogether.** <http://www.telegraph.co.uk/business/2017/12/13/bae-systems-tests-drone-controlled-blasts-air-could-lead-faster/>

Drone Gang Jailed After Impressive 49-Flight Prison Smuggling Run Melanie

Ehrenkranz Yesterday 11:20am



From July 2015 through May of this year, a drone gang [made at least 49 flights](#) into prisons in England and Scotland, **smuggling in weed and mobile phones**. But authorities just jailed eight people after cameras set up outside a prison in Worcestershire to capture wildlife caught



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them in the act, [according to the BBC](#).

Craig Hickinbottom, a 35-year-old inmate, led the operation from inside prison, [the Guardian](#) reports. In total, Hickinbottom's team smuggled between [£600,000 and £1m](#) of goods into prisons across the UK, authorities said.

To whisk in the goods, the smugglers strapped them onto the drones using fishing line and hooks and then flew the clever 'copters over the prison walls. Inmates would reportedly grab them using broom handles or makeshift hooks.

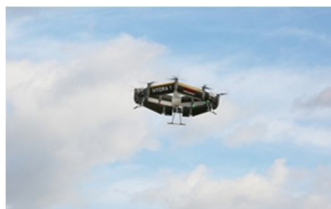
While this operation wasn't caught mid-flight, but rather by a camera intended to capture wildlife, there are a number of strategies being tested to take down rogue drones. Drones can be [shot down](#), [hijacked and disabled](#), or [hit by a jammer](#). [Drone-hunting falcons, however, are out.](#) <https://gizmodo.com/drone-gang-jailed-after-impressive-49-flight-prison-smu-1821252118>

Bell Takes Tailsitter Route To VTOL Cargo Drones *Dec 8, 2017* Kelsey Atherton | *Aviation Week & Space Technology*

The Hybrid Drivetrain Research Aircraft, or Hydra, has a circular wing, with rotors mounted on both the wing and spokes connecting it to a central fuselage. After taking off vertically on its tail, the Hydra climbs to a safe altitude, where it then rotates 90 deg. to level flight.



The distributed-propulsion Hydra has 12 foldable propellers mounted on the wing and spokes. The tailsitting VTOL Hydra transitions to horizontal flight for increased efficiency.



Bell Director of Innovation Scott Drennan says the Hydra is built to overcome the instability of a tailsitting design with its radially symmetric body. It took Bell just five months to go from conception of Hydra to the drone's first flight.

As futuristic as Hydra appears, the drone that stole the show was a tailsitting biplane called APT, for Autonomous Pod Transport.

The current model has about a 10-lb. capacity. Bell envisions medium-size versions having a range of 75-200 nm, and more than 300 nm for much larger models. Even for a vehicle built to carry just 15 lb., Bell sees a 50-nm range as doable, with 70 nm possible with a low cruise speed to conserve power.



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The model flown has a fixed pod, but modularity is one of the major aims of the APT program, with sketches showing much larger multirotor versions and even gimballed storage pods, so that the orientation of the cargo remains the same from vertical takeoff through midair transition and back again to landing. And the capacity imagined is extensive, with cargoes of 500-1,000 lb.

conceivable. [http://aviationweek.com/future-aerospace/bell-](http://aviationweek.com/future-aerospace/bell-takes-tailsitter-route-vtol-cargo-drones?NL=AW-05&Issue=AW-05_20171214_AW-05_363&sfvc4enews=42&cl=article_5&utm_rid=CPEN1000003332045&utm_campaign=12983&utm_medium=email&elq2=daeb0954cd9c465ab4b7c3682f97c849)

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Amazing Images: Intel Drones Inspect 15th Century German Cathedral and

Artwork Miriam McNabbon: December 13, 2017



The Intel® Falcon™ 8+ has become part of a preservation team working on the 15th century Halberstadt Cathedral in Saxony-Anhalt, Germany. The steep spires and fragile condition of the structure make detailed surveys by traditional means of scaffolding “very costly and technically difficult,” says Intel.

The Gothic style church is in delicate condition. Stone statues nearly 20 feet above the cathedral floor are fragile and damaged – and would suffer more damage from ladders or scaffolding. Drones offer a unique, safer and less expensive way of performing a minute examination of the statues and other artwork without risk of damaging pigments or structures.

The Falcon 8+ created 3D structural models for analysis, capturing almost 1,000 images in less than an hour of flight time. These detailed models and inspection images are required before restoration work on the structure can begin.

“Advanced technology, like the Intel® Falcon 8+ drone, provides enormous potential for structural monitoring,” said Norman Hallermann, Bauhaus University Weimar. “Drone technology has allowed us to reach previously inaccessible spaces, like the cathedral’s bell towers. While we are just in the beginning stages of this three-year project, the costs saved by carrying out these inspections via a drone are already being put towards further conservation efforts.” <https://dronelife.com/2017/12/13/amazing-images-intel-drones-inspect-15th-century-german-cathedral-artwork/>



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Virginia investment in radar technology pays dividends for drone research

Wednesday, Dec. 13, 2017



Funding from the Commonwealth of Virginia for a state-of-the-art radar laid the groundwork for a research award of **\$1.6 million from NASA** to the [Virginia Tech Mid-Atlantic Aviation Partnership](#).

The project focuses on a key challenge for the industry: **enabling unmanned aircraft to detect and avoid other aircraft**. One of the most pressing topics in the UAS industry is the growing demand for flights beyond the operator's visual line of sight. One of the most promising alternatives is a ground-based radar that could detect both the drone and anything else in the airspace.

To explore that option, the Commonwealth of Virginia granted MAAP the funding to purchase a mobile radar system from Gryphon Sensors that combines radar with optical and spectrum sensors, providing multiple ways to detect aircraft and other objects. The testing will play out on a 5,000-square-mile unmanned-aircraft test range in central Virginia, a unique corridor set up to provide a safe environment for BVLOS research flights.

"The impact of this long-term is tremendous, and the support the state provided was instrumental in ensuring that this research would happen in Virginia," Blanks said. "We're breaking new boundaries and leading the state and the country in moving UAS integration forward. **The state's investment paid off.**" <http://augustafreepress.com/virginia-investment-radar-technology-pays-dividends-drone-research/>

15Dec17

Military robots are getting smaller and more capable *Soon, they will travel in swarms* *The Economist | Science and technology Dec 14th 2017*



Military laboratories around the planet are busy developing small, autonomous robots for use in warfare, both conventional and unconventional. In America, in particular, a programme called MAST (Micro Autonomous Systems and Technology), which has been run by the US Army Research Laboratory in Maryland, is wrapping up this month after ten successful years. Its successor, the Distributed and Collaborative Intelligent Systems and Technology (DCIST) programme, which began earlier this year, is now getting into its stride.



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DCIST's purpose is to take autonomous robots and make them co-operate. The result, if the project succeeds, will be swarms of devices that can take co-ordinated action to achieve a joint goal.

Existing small drones are usually polycopters—helicopters that have a set of rotors (generally four or six) arranged at the vertices of a regular polygon, rather than a single one above their centre of gravity. Their proposed replacement is the **cyclocopter**.

Cyclocopter aerodynamics is more like that of insects than of conventional aircraft, in that lift is generated by stirring the air into vortices rather than relying on its flow over aerofoils.. Cyclocopters get better as they get smaller. They are also quieter.

The next challenge—the one that people like Dr Russell particularly worry about—is getting the robots to swarm and co-ordinate their behaviour effectively. Under the aegis of MAST, a group from the General Robotics, Automation, Sensing & Perception (GRASP) laboratory at the University of Pennsylvania did indeed manage to make drones fly together in co-ordinated formations without hitting each other. They look good when doing so—but, to some extent, what is seen is an illusion. GRASP's drone swarms employ ground-based sensors to track individual drones around, and a central controller to stop them colliding.

“**Heterogeneous group control**” is a new discipline that aims to tackle the thorny problem of managing units that consist of various robots—some as small as a postage stamp, others as large as a jeep—as well as human team members. Swarms will also need to be able to break up into sub-units to search a building and then recombine once they have done so, all in a hostile environment.

Such things are the goals of DCIST. The first tranche of grants to these ends, some **\$27m** of them, has already been awarded to the University of Pennsylvania, the Massachusetts Institute of Technology, the Georgia Institute of Technology and the University of California, Berkeley. When DCIST itself wraps up, probably in 2022, the idea of Slaughterbots may seem a lot less fictional than it does now. <https://www.economist.com/news/science-and-technology/21732507-soon-they-will-travel-swarms-military-robots-are-getting-smaller-and-more>